

REMARKS/ARGUMENTS

Reconsideration is respectfully requested of the Official Action of August 11, 2006, relating to the above-identified application.

A request for a one-month extension of time, together with the associated fee, is attached.

Claims 1 to 5 and 7 to 16 stand withdrawn from further consideration. Claims 17 and 35 have been amended by the foregoing amendment and Claim 18 has been deleted. Hence, the claims under consideration are 17, 19-21, 23-33, 35 and 36.

The rejection of Claim 35 under 35 U.S.C. § 112 (second paragraph) as allegedly indefinite is traversed and reconsideration is respectfully requested in view of the foregoing amendment. Claim 35 has been amended to refer to and be dependent on Claim 19 which identifies the distributing medium. Claim 35 has also been amended to incorporate the feature of Claim 33 upon which Claim 35 was formerly dependent. No new matter is presented. Withdrawal of the rejection is therefore requested.

Claim 17 has been amended to add new subparagraph (d) which specifies that each wall element comprises a plurality of tubular cavities. The basis for this feature is found in Figs. 1 to 6 which all show a plurality of tubular cavities in each wall element. The amendments to Claim 17 also introduce the features from original Claim 18 in new subparagraph (e); namely, that each wall element has at least one feed channel for at least one reactant which channel leads through the lateral surface (2) of the wall (1) into the reaction spaces (3).

Claim 17 has also been amended in new subparagraph (c) to specify the slot-shaped reaction spaces have a slot width of between 0.05 and 5 mm, whereby in case of explosive

reaction mixtures, the slot width of the slot-shaped reaction spaces is sufficiently small in order to avoid spreading of flames.

Applicants respectfully submit Claim 17 cannot be construed in such a way that the claim would encompass a structure where only one cavity is formed in each wall element. Claim 17 as amended clearly points out in element (d) that "each wall element comprises a plurality of tubular cavities being parallel to each other for conducting a fluid heat-exchange medium thereto." Hence, Claim 17 excludes a structure having only one cavity.

With respect to the issue of what constitutes a slot-shaped reaction space, Claim 17 now also specifies that these spaces have a slot width of between 0.05 and 5 mm so that in the event of an explosive reaction, the width of the slot is such that it avoids the spreading of flames.

Note also that Claim 17 has been amended to even further clarify the feed channel by specifying that the feed channel leads into the reaction space through at least one of the lateral surfaces of the wall element. Hence, it is important to recognize that this definition requires the feed channel to penetrate one of the lateral surfaces which forms the slot-shaped reaction spaces. This is supported by Fig. 4 which shows feed channels 16 leading through the lateral surfaces 2 with discharge opening 17 but not into feed channels 15.

It is submitted that Claim 17 even more clearly points out and distinctly claims applicants' contribution to the art.

The rejection of Claims 17 and 26 as allegedly anticipated (35 U.S.C. § 102(b)) or rendered obvious (35 U.S.C. § 103(a)) in view of *Lowenstein et al.*, U.S. 5,638,900, is traversed and reconsideration is respectfully requested. With reference to Figures 1 and 5, *Lowenstein* shows a heat exchange assembly including a plurality of plates (4) each such plate having a

plurality of channels (18a, 18b, 18c, etc.) there through for the flow of the heat exchange fluid. The device of *Lowenstein* can include an assembly having at least two stacked spaced apart plates (4), each plate having a first end (24a) and an opposed end (24b) and having a plurality of channels therein for the flow of first heat exchange fluid in a first plane. It also has one inlet (10) and one outlet (12) for the first exchange fluid wherein the inlet and the outlet are angled with respect to the first plane; e.g. 90°. Also included in the *Lowenstein* device is a spacer (6) for maintaining the plates in a spaced-apart relationship and to thereby provide a space (8) between the spaced-apart plates for a second heat exchange material in a heat exchange relationship with the first heat exchange fluid in a second plane different from the first plane.

A number of significant features of applicants' structure defined in Claim 17 are not shown or suggested by the *Lowenstein* patent. For example, *Lowenstein* does not disclose an apparatus where slot-shaped spaces enable supplying at least two fluid reactants from the same side of the block. Nor does *Lowenstein* show that the spaces in his plate (4) are oriented to guide the reaction mixture through the reaction spaces in the same direction and in parallel flows as stated in element (b) of applicants' Claim 17.

Neither does *Lowenstein* show a feed channel which leads into a reaction space through at least one of the lateral surfaces of the wall element as required by element (e) of applicants' Claim 17. It is, therefore, clear that the apparatus of *Lowenstein* is missing several important features which are not found in the reference and which are claimed herein. Accordingly, *Lowenstein* does not anticipate the claimed subject matter.

As *Lowenstein* fails to disclose a reaction carried out inside slot-shaped spaces, the reference would not motivate a person skilled in the art to modify the *Lowenstein* apparatus in

order to supply at least two fluid reactants to the slot-shaped spaces and to add a feed channel which leads through the lateral surfaces of the wall element as called for by the preamble in Claim 17 as well as element (b) of Claim 17. Nothing in *Lowenstein* would suggest any benefit or advantage to be obtained by introducing the features set forth in applicants' Claim 17 into the *Lowenstein* device. Consequently, there is no motivation to modify or change any of the features of the *Lowenstein* device in the direction of applicants' subject matter. Accordingly, it is submitted that Claim 17 is not rendered obvious by the teachings of the cited *Lowenstein* reference.

The Official Action alleges that spacings (8) are "able to have fluids supplied from the same side of the block, being able to guide the fluids through the spaces 8 in the same direction and in parallel flows..."

Applicants are unable to find any support in *Lowenstein* for this statement.

With respect to spacings 8, the reference says that the spacings are for the stationary presence or flow of a heat exchange medium (see col. 3, lines 50-51). Spacings 8 serve as the flow path for the second heat exchange medium; see col. 3, lines 61-64. Or the heat exchange medium remains stationary in the spacings; col. 3, lines 65-67.

Nothing is said in the reference about supplying fluids, heat exchange, or otherwise, from the "same side of the block". The "block" referred to in the Office Action is not identified with reference to any element of *Lowenstein*.

Applicants respectfully submit that *Lowenstein* neither anticipates nor renders obvious the subject matter claimed herein.

The rejection of Claims 17, 19, 24, 26, 28, 29, 33 and 36 as allegedly anticipated or rendered obvious by the patent of *Skala et al.*, U.S. 6,132,689, is traversed and reconsideration is respectfully requested.

The patent of *Skala* relates to a multi-stage isothermal carbon monoxide preferential oxidation reactor. There is formed a plurality of serially arranged, catalyzed heat exchangers each separated from the next by a mixing chamber for homogenizing the gases exiting one heat exchanger and entering the next. Figs. 1, 2, 5, and 6 refer to four different alternative embodiments of the invention while Figs. 3 and 4 refer only to the embodiment of Fig. 2.

In the embodiment of Fig. 1, each of the wall elements formed by plates 10 and spacer bars 18 form only a single cavity 16 which is not of tubular shape. Applicants claims in contrast call for walls comprising a plurality of tubular cavities, as shown in Fig. 4, as "5" of applicants' drawings. *Skala* also has no disclosure of a feed channel which leads through one of the lateral surfaces of the wall element. Consequently, the embodiment of Fig. 1 of *Skala* does not anticipate the subject matter of amended Claim 17.

In the embodiment of Fig. 2 of *Skala*, each of the wall elements formed by plates 68 and spacer bars 90 comprise only a single cavity 76 which is not of a tubular shape. The slot-shaped reaction spaces 70, 72 and 74 are also not oriented to guide the reaction mixture through the reaction spaces in the same directions. In the reaction space 72, the reaction mixture is guided in a direction opposite to the direction in reaction spaces 70 and 74. There is also no disclosure of a feed channel leading through one of the lateral surfaces of the wall element. Therefore, the embodiment of Fig. 2 of *Skala* does not anticipate the subject matter of amended Claim 17.

Nothing in *Skala* would suggest forming a plurality of tubular cavities in the wall elements, as shown for example in applicants' Fig. 4.

Thus, applicants claims which recite that important feature in element (d) in Claim 17 are neither anticipated nor rendered obvious by *Skala*.

The same arguments hold for the embodiment of Fig. 5 of *Skala* with wall elements formed by plates 110 and 112 comprising only a single cavity 108 and slot-shaped reaction spaces 104 guiding the reaction mixture in a direction opposite to the direction and reaction spaces 102 and 106.

In the embodiment of Fig. 6 of *Skala*, each of the wall elements formed by plates 176 and frames 178 comprise only a single cavity 180, which is not of a tubular shape. There is also no disclosure of a feed channel which leads through one of the lateral surfaces of the wall element. Consequently, the embodiments of Fig. 5 and 6 of *Skala* do not anticipate the subject matter of amended Claim 17.

Accordingly, for the reasons set forth above, applicants respectfully submit that the Official Action fails to establish anticipation or *prima facie* obviousness of the claimed invention and, therefore, the rejection should be withdrawn.

The rejection of Claim 25, 27 and 30 under 35 U.S.C. § 103(a) as obvious over *Skala* in view of *Haseldon*, U.S. 3,528,783, is traversed and reconsideration is respectfully requested. The *Skala* patent is discussed above and the remarks apply here as well.

Haseldon does not disclose any feed channel leading to the reaction space through one of the lateral surfaces formed by plates 13 of the wall element 11. The disclosure of a finned surface in column 4, lines 4 to 8, does not imply the formation of a feed channel for a reactant as

nothing is said in *Haseldon* about the shape and direction of such fins. The disclosure of fins relates to measures for promoting heat transfer between the lateral surface and a catalyst located within the slotted-shaped reaction space and, therefore, has no relationship to the feeding of reactants.

In the Official Action, the Examiner alleges on page 7, lines 4 to 6, that a profiled structure will inherently define at least one feed channel that leads through one of the lateral surfaces of the wall elements. However, there is no rational basis for this assumption and it is in clear contradiction to the application which discloses in Fig. 1 and on page 14, lines 14 to 17, wall elements with a profiled structure, the profiling having been done by roughening, where the profiled structure does not define a feed channel leading through a lateral surface of the wall element.

Combining *Skala* with *Haseldon* would not motivate a person skilled in the art to add feed channels leading into the slot-shaped reaction spaces through one of the lateral surfaces of the wall element to any of the devices disclosed in *Skala*. Accordingly, applicants respectfully submit that the references fail to create *prima facie* obviousness of the claimed invention.

The rejection of Claims 20 and 21 under 35 U.S.C. § 103(a) in view of *Skala* taken with *Alagy, et al.*, US 5,037,615, is traversed and reconsideration is respectfully requested.

Skala is discussed above and the remarks made above apply here as well.

Alagy teaches a distributing medium but fails to suggest any of the specific features of applicants' invention that are missing from *Skala*. Therefore, even if *Alagy*'s distributing medium were to be combined with the *Skala* device, the resulting combination would still not

reach the invention claimed herein. The combination of *Skala* and *Alagy* does not create *prima facie* obviousness of the claimed invention.

The rejection of Claim 23 under 35 U.S.C. § 103(a) in view of *Skala* taken with *Pow, et al.*, US 5,456,889, is traversed and reconsideration is respectfully requested. *Skala* has already been discussed and its shortcomings have been noted. *Pow* shows that granular catalysts are known. However, even if the reaction spaces of *Skala* were to be filled with the *Pow* catalyst, the result would still not arrive at applicants' invention for the reason that *Skala* is missing important features of the claimed invention. Therefore, the combination of *Skala* and *Pow* fail to establish *prima facie* obviousness of the invention claimed by applicants.

Favorable action at the Examiner's earliest convenience is respectfully requested.

Respectfully submitted,

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